California Energy Commission

STAFF REPORT

LOCALIZED HEALTH IMPACTS REPORT

Addendum 1 for Selected Projects Awarded Funding Through the Alternative and Renewable Fuel and Vehicle Technology Program Under Solicitation GFO-15-605 – Light-Duty Vehicle Hydrogen Refueling Infrastructure

California Energy Commission

Edmund G. Brown Jr., Governor

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ABSTRACT

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). This statute, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008), authorizes the California Energy Commission to "develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies." Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the ARFVTP through January 1, 2024.

AB 118 also directs the California Air Resources Board (CARB) to develop guidelines to ensure air quality improvements. The CARB Air Quality Improvement Program (AQIP) Guidelines, approved in 2008, are published in the *California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1, AB 118 Air Quality Guidelines for the Alternative and Renewable Fuel and Vehicle Technology Program and the AQIP*. The AQIP Guidelines require the California Energy Commission, as the funding agency, to analyze the localized health impacts of ARFVTP-funded projects that require a permit (13 CCR § 2343). As provided by 13 CCR § 2343, this Localized Health Impacts Report is required to be available for public comment for 30 days prior to the approval of projects.

This Localized Health Impacts Report analyzes the combined impacts in the communities, including exposure to air contaminants or localized air contaminants, or both. These impacts include, but are not limited to, communities of minority populations or low-income populations, as declared by the light-duty vehicle hydrogen refueling infrastructure proposers or as determined by Energy Commission staff. Appendix A, Localized Health Impacts Report Assessment Method, describes the analysis used for this Localized Health Impacts Report.

Keywords: Air pollution**,** air quality, Air Quality Improvement Program (AQIP), California Air Resources Board (CARB), Assembly Bill (AB) 118, California Environmental Quality Act (CEQA), criteria emissions, demographics, environmental justice (EJ) indicators, Environmental Justice Screening Method (EJSM), fuel cell electric vehicles , localized health impacts (LHI)

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EXECUTIVE SUMMARY

Under the *California Code of Regulations Title 13, (CCR § 2343),* this Localized Health Impacts Report describes the alternative fuel demonstration projects proposed for Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) funding that may or may not require a conditional or discretionary permit or environmental review, such as conditional use permits, air quality permits, wastewater permits, hazardous waste disposal permits, and other land-use entitlements. This report does not include projects that require only residential building permits, mechanical/electrical permits, or fire/workplace safety permits, as these are determined to have no likely impact on the environment.

The California Energy Commission is required to assess the localized health impacts of the projects proposed for ARFVTP funding. This Localized Health Impacts Report focuses on the potential impacts projects may or may not have on a particular community, particularly those communities that are considered especially vulnerable to emissions increases. For high-risk communities, this report assesses the impacts from criteria emissions/air toxics and the air quality attainment status.

Environmental justice communities, low-income communities, and minority communities are considered to be the most impacted by any project that could result in increased criteria and toxic air pollutants within an area because these communities typically have the most significant exposure to the emissions. Assessing projects and the communities surrounding them is important because of the health risks associated with these pollutants. Preventing health issues from air pollution in any community is important, but it is especially important to minimize any negative impacts in communities that are already considered to be at risk due to their continued exposure to these contaminants.

The Energy Commission proposes to fund five additional stations under grant solicitation GFO-15-605, which will expand the network of publicly accessible stations that serve California's light-duty fuel cell electric vehicles.

The projects in this Localized Health Impacts Report are assessed for potential health impacts for the communities in which they will be located. Based on this analysis, it is not anticipated that implementing these projects will have negative impacts because there will not be a net increase in criteria and toxic emissions, specifically in those communities that are considered most vulnerable. Potentially, the projects stand to provide improved quality of life through cleaner air.

CHAPTER 1:
Projects Proposed for Funding

On April 6, 2016, the California Energy Commission released a competitive grant funding opportunity titled "Light-Duty Vehicle Hydrogen Refueling Infrastructure" (GFO-15-605) under the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). This grant opportunity was an offer to fund projects that will expand the network of publicly accessible hydrogen refueling stations that serve California's light-duty fuel cell electric vehicles.

On February 17, 2017, the Energy Commission posted the notice of proposed awards (NOPA) for GFO-15-605, resulting in one Interstate 5 (I-5) connector station and 15 main stations proposed for funding.

On November 8, 2017, the Energy Commission released a second NOPA that provides five additional proposed stations recommended for funding. This Localized Health Impacts Report assesses and reports on the potential localized health impacts of the five additional stations with public review and comment for a 30-day period.

This chapter summarizes the projects proposed for Energy Commission funding. Table 1 provides the applicant, project address, and environmental justice (EJ) indicators. (See Appendix A.)

Table 1: Proposed Projects for Light-Duty Vehicle Hydrogen Refueling Infrastructure With Environmental Justice Indicators

Main Station Category		
Applicant	**Project Address**	**EJ Indicator(s)**
Equilon Enterprises LLC (dba Shell Oil Products U.S.)	101 Bernal Road San Jose, CA 95119	Minority
FirstElement Fuel, Inc.	9988 Wilshire Boulevard Beverly Hills, CA 90210	None
	15544 San Fernando Mission Boulevard Mission Hills, CA 91345	Minority, Age, and Unemployment
	503 Whipple Avenue Redwood City, CA 94063	Minority
	3780 Cahuenga Boulevard Studio City, CA 91604	None

Source: California Energy Commission staff

CHAPTER 2:
Added Stations

Equilon Enterprises LLC (DBA Shell Oil Products U.S.)

The proposed hydrogen refueling station will be installed within Shell's existing conventional fueling network of retail stations, offering fuel cell electric vehicle drivers the equivalent service to that of conventional vehicles. The station will have two 200 kilogram systems, with the capacity of fueling up to 400 kilograms per day, which can service up to 100 fuel cell electric vehicles per day.

The proposed project will use new and efficient heavy-duty on-road diesel trucks to deliver hydrogen to the refueling station.

Upon completion, the hydrogen refueling station will not emit either criteria pollutants or toxic air contaminants into the localized air shed; thus, there are no increased impacts to the localized air shed to adversely affect the health of the local community. Rather, the net effect of operating fuel cell vehicles, instead of gasoline vehicles, is significant removal of pollutants and toxic air contaminants to the localized air shed. The emissions associated with the delivery of hydrogen to the station are negligible.

San Jose

101 Bernal Road, San Jose, CA 95119

The proposed hydrogen refueling station will be at an existing gasoline fueling station and identified in the San Jose General Plan as neighborhood/community commercial. Surrounding the site are retail businesses, commercial buildings, and residential neighborhoods. The proposed site is within one mile of eight schools, two day care centers, and two medical offices/hospitals.

Table 2: Truck Deliveries of Hydrogen Station and Transport-Related Emissions

Station Location	Delivery Distance (miles/round trip)	Number of Hydrogen Deliveries (2018-2022)	Transport-Related Emissions (kilograms/over five-year span)	
San Jose	22	665		2018-2022
			NOx	15.5
			PM 2.5	0.3
			HC	1.1
			CO	4.4

Source: Equilon Enterprise LLC

FirstElement Fuel, Inc.

The proposed hydrogen refueling stations will be at existing conventional retail fuel stations and will have the capacity of 310 kilograms per day with a design that is ready to be upgraded to 600 kilograms per day. All stations will be in strategic locations to expand coverage and create redundancy in key markets.

Beverly Hills

9988 Wilshire Boulevard, Beverly Hills, CA 90210

The proposed hydrogen refueling station will be at an existing gasoline station. There is a service station and convenience store on the property. The proposed site is within one mile of three schools, two day care centers, and no medical offices/hospitals.

Mission Hills

15544 San Fernando Mission Boulevard, Mission Hills, CA 91345

The proposed hydrogen refueling station will be at an existing gasoline station. There is a service station and convenience store on the property. The proposed site is within one mile of three schools, two day care centers, and one medical office/hospital.

Redwood City

503 Whipple Avenue, Redwood City, CA 94063

The proposed hydrogen refueling station will be at an existing gasoline station. There is a service station and convenience store on the property. The proposed site is within one mile of five schools, three day care centers, and two medical offices/hospitals.

Studio City

3780 Cahuenga Boulevard, Studio City, CA 91604

The proposed hydrogen refueling station will be at an existing gasoline station. There is a service station and convenience store on the property. The proposed site is within one mile of one school, two day care centers, and no medical offices/hospitals.

Table 3: Truck Deliveries of Hydrogen per Station and Transport-Related Emissions

Station Location	Delivery Distance (average-miles/round trip, for each station)	Number of Hydrogen Truck Deliveries for the First Five Years of Operation (average for each station)	Transport-Related Emissions (station average; kilograms over five-year span)
Beverly Hills Mission Hills Redwood City Studio City	50	1000	

	2018-2022
NOx	494.5
SOx	1
ROG	21
CO	79.5
PM	21.5

Source: First Element Fuel Inc.

CHAPTER 3: Approach

The Localized Health Impact Report (LHI Report) Assessment Method in Appendix A assesses communities potentially impacted by air pollution and possibly benefitted by hydrogen refueling stations. The California Air Resources Board's (CARB) *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution for Assembly Bill (AB) 32 Assessments* is also used to integrate data to identify low-income communities that are highly impacted by air pollution.[1] Other resources used in this assessment are the *California Infrastructure State Implementation Plans,*[2] which contain publicly noticed air quality attainment plans, and the *Green Book Nonattainment Areas for Criteria Pollutants.*[3]

For this LHI Report, the Energy Commission interprets "permits" to connote discretionary and conditional use permits because they require a review of potential impacts to a community and the environment before issuance. Since ministerial-level permits, such as building permits, do not assess public health-related pollutants, the Energy Commission staff does not assess projects requiring only ministerial-level permits in this report.

The cities/towns where the projects will be located are in nonattainment zones for ozone, PM[4] 2.5, and PM 10. Table 1 shows the EJ indicators for the projects covering five cities, that is, minority populations, low incomes, and highly sensitive groups based on age (individuals younger than 5 years of age and older than 65 years of age). Table 4 shows the demographics. Mission Hills is the only city classified as a high-risk community, according to the Environmental Justice Screening Method (EJSM).

Staff considered emissions from the proposed projects. Truck delivery of hydrogen will be the only source of criteria pollutants; however, due to the infrequency of deliveries, the impacts will be marginal. Assessed criteria pollutants may include reactive organic gases (ROG), carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur oxide (SO_x), hydrocarbons (HC), and particulate matter (PM10).

The proposed projects are expected to have a net benefit by reducing emissions and leading to improved air quality. While overall air quality depends on several factors, staff expects that air quality will improve over time where the sites are proposed because there are no expected harmful emissions from the stations and there will be reduced emissions overall from driving fuel cell electric vehicles.

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1 California Air Resources Board, *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution, 2010* (Sacramento, California).
2 http://www.arb.ca.gov/planning/sip/sip.htm.
3 http://www.epa.gov/oaqps001/greenbk.
4 "Particulate matter" is unburned fuel particles that form smoke or soot and stick to lung tissue when inhaled, and is a chief component of exhaust emissions from heavy-duty diesel engines.

Table 4: Environmental Justice (EJ) Indicators Compared With California

Yellow highlighted areas indicate numbers (percentages) that meet the definition for EJ indicators.
An asterisk may signify a default to city/county demographics and/or labor information.

	Number of EJ Indicators by Category	Below Poverty Level (2011-2015)	Black Persons (2010)	American Indian and/or Alaska Native (2010)	Asian and/or Pacific Islander (2010)	Persons of Hispanic or Latino Origin (2010)	Persons Under 5 Years of Age (2010)	Persons Over 65 Years of Age (2010)	Unemployment Rate (October 2017)
California		**15.3%**	**6.2%**	**1.0%**	**13.0%**	**37.6%**	**6.8%**	**11.4%**	**4.9%**
EJ Indicator Threshold		**>15.3%**	**>30%**	**>30%**	**>30%**	**>30%**	**>8.16%**	**>13.8%**	**>4.9%**
Beverly Hills	None	8.9%	2.2%	0.1%	8.9%	5.7%	3.8%	8.4%	4.1%
Mission Hills	3	5.8%	2.5%	2.1%	3.5%	31.8%	6.1%	14.7%	5.7%
Redwood City	1	9.4%	2.4%	0.7%	10.7%	38.8%	7.5%	10.6%	2.2%
San Jose	1	11.3%	3.2%	0.9%	32.0%	33.2%	7.3%	10.1%	3.3%
Studio City*	None	7.1%	4.1%	0.3%	6.7%	8.5%	5.2%	13.4%	4.6%

Sources: Unemployment information from the State of California, Employee Development Department Labor Market Information Div.: http://www.labormarketinfo.edd.ca.gov/data/unemployment-and-labor-force.html#Tool and http://www.labormarketinfo.edd.ca.gov/data/labor-force-and-unemployment-for-cities-and-census-areas.html U.S. Census Bureau, http://www.census.gov/quickfacts/table/PST045215/0664000,06,00 and http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

CHAPTER 4:
Summary

If funded, the proposed projects would result in five sites for hydrogen refueling. The new hydrogen refueling sites will increase the use of hydrogen fuel cell vehicles. As more hydrogen fuel cell vehicles enter the market and begin to displace gasoline and diesel vehicles, tailpipe pollutants will decrease significantly.

The new hydrogen facilities stand to nominally increase traffic for the projects that involve hydrogen delivery by truck. Yet, a net benefit is realized from less petroleum use and more alternative fuel use as a result of these proposed projects. The anticipated impacts to the cities where these projects will be located are positive in terms of cleaner air and anticipated greenhouse gas reductions. There will be a reduction of known harmful emissions when a fuel cell electric vehicle refuels at these stations as it will replace gasoline vehicles, which would also help achieve both energy and climate change goals.

CHAPTER 5:
Acronyms

Air Quality Improvement Program (AQIP)

California Air Resources Board (CARB)

Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

Assembly Bill (AB)

California Code of Regulations (CCR)

California Environmental Quality Act (CEQA)

Carbon monoxide (CO)

Environmental justice (EJ)

Environmental justice screening method (EJSM)

Grant funding opportunity (GFO)

Hydrocarbons (HC)

Localized health impacts (LHI)

Nitrogen oxide (NO_x)

Notice of proposed awards (NOPA)

Particulate matter (PM)

Reactive organic gases (ROG)

State Implementation Plan (SIP)

Sulfur oxide (SO_x)

APPENDIX A:
Localized Health Impacts Report Assessment Method

This LHI Report assesses the potential impacts to communities because of the projects proposed by the ARFVTP. This report is prepared under the *California CARB AQIP Guidelines, California Code of Regulations, Title 13, Motor Vehicles, Chapter 8.1 (CCR § 2343)*:

"(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:

> (A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.
>
> (B) Projects must be selected and approved for funding in a publicly noticed meeting."

This LHI Report is not intended to be a detailed environmental health impact analysis of proposed projects nor is it intended to substitute for the environmental review conducted during the California Environmental Quality Act (CEQA) review. This LHI Report includes staff's application of the Environmental Justice Screening Method (EJSM) to identify projects located in areas with social vulnerability indicators and the greatest exposure to air pollution and associated health risks.[5]

The EJSM was developed to identify low-income communities highly affected by air pollution for assessing the impacts of climate change regulations, specifically Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006. The EJSM integrates data on (i.) exposure to air pollution, (ii.) cancer risk, (iii.) ozone concentration, (iv.) frequency of high ozone days, (v.) race/ethnicity, (vi.) poverty level, (vii.) home ownership, (viii.) median household value, (ix.) educational attainment, and (x.) sensitive populations (populations under 5 years of age or over 65 years of age).

5 California Air Resources Board (ARB). *Air Pollution and Environmental Justice, Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability Into Regulatory Decision-Making, 2010.* (Sacramento, California) Contract authors: Manuel Pastor Jr., Ph.D., Rachel Morello-Frosch, Ph.D., and James Sadd, Ph.D.

To determine high-risk communities, environmental justice (EJ) indicators for locations of the hydrogen refueling stations are compared to data from the U.S. Census Bureau or other public agency. Staff identifies high-risk communities by using a two-part standard. For a community to be considered high-risk, for this assessment, it must meet both Parts 1 and 2 of this standard.

Part 1:

- Communities located in nonattainment air basins for ozone, PM 2.5, or PM 10

Part 2:

- Communities having more than one of the following EJ indicators: (1) minority, (2) poverty, (3) unemployment and (4) high percentage of population under 5 years of age and over 65 years of age. The EJ indicators follow:
    - A minority subset represents more than 30 percent of a given city's population.
    - A city's poverty level exceeds California's poverty level.
    - A city's unemployment rate exceeds California's unemployment rate.
    - The percentage of people living in that city are younger than 5 years of age or older than 65 years of age is 20 percent higher than the average percentage of persons under 5 years of age or over 65 years of age for all of California.